

ABM \$10.00

PASCAL USERS GROUP

Pascal News

Communications about the Programming Language Pascal by Pascalers

- APL Scanner
- Computer Generated Population Pyramids
- Path Pascal
- Introduction to Modula-2
- Validation Suite Reports
- Announcements

Number

26

JULY 83

POLICY: PASCAL NEWS

(Jan. 83)

- *Pascal News* is the official but *informal* publication of the User's Group.

Purpose: The Pascal User's Group (PUG) promotes the use of the programming language Pascal as well as the ideas behind Pascal through the vehicle of *Pascal News*. PUG is intentionally designed to be non political, and as such, it is not an "entity" which takes stands on issues or support causes or other efforts however well-intentioned. Informality is our guiding principle; there are no officers or meetings of PUG.

The increasing availability of Pascal makes it a viable alternative for software production and justifies its further use. We all strive to make using Pascal a respectable activity.

Membership: Anyone can join PUG, particularly the Pascal user, teacher, maintainer, implementor, distributor, or just plain fan. Memberships from libraries are also encouraged. See the COUPON for details.

- *Pascal News* is produced 4 times during a year; January, April, July October.
- ALL THE NEWS THAT'S FIT, WE PRINT. Please send material (brevity is a virtue) for *Pascal News* single-spaced and camera-ready (use dark ribbon and 15.5 cm lines!)
- Remember: ALL LETTERS TO US WILL BE PRINTED UNLESS THEY CONTAIN A REQUEST TO THE CONTRARY.
- *Pascal News* is divided into flexible sections:

POLICY — explains the way we do things (ALL-PURPOSE COUPON, etc.)

EDITOR'S CONTRIBUTION — passes along the opinion and point of view of the editor together with changes in the mechanics of PUG operation, etc.

APPLICATIONS — presents and documents source programs written in Pascal for various algorithms, and software tools for a Pascal environment; news of significant applications programs. Also critiques regarding program/algorithm certification, performance, standards conformance, style, output convenience, and general design.

ARTICLES — contains formal, submitted contributions (such as Pascal philosophy, use of Pascal as a teaching tool, use of Pascal at different computer installations, how to promote Pascal, etc.).

OPEN FORUM FOR MEMBERS — contains short, informal correspondence among members which is of interest to the readership of *Pascal News*.

IMPLEMENTATION NOTES — reports news of Pascal implementations: contacts for maintainers, implementors, distributors, and documentors of various implementations as well as where to send bug reports. Qualitative and quantitative descriptions and comparisons of various implementations are publicized. Sections contain information about Portable Pascals, Pascal Variants, Feature-Implementation Notes, and Machine-Dependent Implementations.

VALIDATION SUITE REPORTS — reports performance of various compilers against standard Pascal ISO 7185.

Pascal News

Communications about the Programming Language Pascal by Pascalers

JULY 1983

NUMBER 26

2 EDITOR'S NOTES

5 OPEN FORUM

SOFTWARE TOOLS

11 Program APL Scanner

By Vincent Dichristofano, Alan Kaniss, Thomas Robinson and John Santini

ARTICLES

26 "Don't Fail Me Now" *By Srully Blotnick*

27 Computer Generated Population Pyramids Using Pascal *By Gerald R. Pitzl*

32 Path Pascal — A Language for Concurrent Algorithms *By W. Joseph Berman*

37 An Introduction to Modula-2 for Pascal Programmers

By Lee Jacobson and Bebo White

BOOK REPORT

41 Data Structures Using Pascal

ANNOUNCEMENTS

42 SBB Announces Pascal Compiler for IBM PC

42 Sage Opens Boston Division

42 New 16 Bit Sage IV

43 New Modula-2 Manual

44 USUS Fall Meeting

44 Text Editor Interest Group

44 Modula-2 Users Group

45 USUS San Diego Meeting

46 Volitions Modula-2 for IBM PC

47 IMPLEMENTATION REPORT

VALIDATION SUITE REPORT

48 OmegaSoft Pascal Version 2

51 SUBSCRIPTION COUPON

53 VALIDATION SUITE COUPON

55 USUS MEMBERSHIP COUPON

Charles Gaffney Publisher and Editor

The Pascal Newsletter is published by the Pascal Users Group, 2903 Huntington Rd., Cleveland, Ohio 44120. The Pascal Newsletter is a direct benefit of membership in PUG.

Membership dues in PUG are \$25.00 US regular, other forms of membership please inquire. Inquiries regarding membership should be sent to the above address. Newsletter correspondence and advertising should be sent to the editor at the aforementioned address.

Advertising Rates: \$300.00 Full Page. Please give your preference of magazine location: front, center, or back.

Hello,

Well, this is the third issue I am involved with and there have been many changes. I would like to write of Pascal first.

Pascal has enjoyed a jump in attention in the last year. One reason is that there are Pascal compilers available for many machines and, I am tempted to say, they are available for any machine. Most of the major main frames have Pascal either directly or from a third party.

One step down in size, I know of only one machine, the Tandem computer which is without a Pascal implementation. A Tandem representative here in Cleveland informed me they have a language called "TAL" and in many cases will execute a Pascal program with no changes.

A couple more steps down in size are the small Digital Equipment machines and compilers are available from about four sources. IBM has the Display writer and Datamaster. These were released without our language, but in the last year, UCSD Pascal has been made available through IBM. Apple Computer has been a strong and long supporter of Pascal. TRS 80 has UCSD Pascal.

The smallest machine with Pascal is the TI 99/4A. In this size, Commodore has promised Pascal for this summer on the "64" and "128" machines.

The small computer, that is, the home computers and small business computers, have exceeded \$10 million in sales. This is according to Future Computing, a Richardson, Texas research firm.

With a guess, I would say that Pascal is implemented on at least 25% of these machines. If only 1% of these were being used to learn and program Pascal, then 25,000 people are presently involved. This is a lot of people looking for the best books from which to learn.

I am making an appeal to our members to submit comments and reviews of text books so that we all may benefit from your experience. I get calls from authors requesting information on Pascal. To these people, the best I can do is to send complete sets of *Pascal News*! With your comments and criticism, perhaps we could influence future text books.

Herb Rubenstein of Budget Computer in Golden, Colorado has sent a small article from *Popular Computing*. It seems that advanced placement test in computer science will use structure programming and the Pascal language. These tests allow up to one year of college level credits in computer science. The author of this article, Dan Watt, believes that the choice of Pascal in the testing may lead to Pascal as a defacto standard in high schools preparing students for college. Let me quote the last paragraph:

"This situation illustrates the power of the testing establishment to influence the lives of students and teachers. Although the vast majority of high schools now offer Basic as the standard computer language for most programming and computer science classes, this action by the College

Board may lead to the establishment of Pascal as a defacto standard for high school teaching and spawn an entire mini industry of curriculum to meet the new requirements. It may also offer significant school marketing advantages to micro-computer companies that already support Pascal — such as Apple, IBM and Texas Instruments."

I would like to see comments from you regarding this use of Pascal in a rite of passage.

In this issue, you will find a reprint of Dr. Sully Blotnick's column from *Forbes* magazine. I like this column because of the clever way he has made our economy dependent on you learning Pascal.

I enjoy *Forbes* magazine. They emphasize common sense and illustrate proven business practices. *Forbes* also takes a pulse of industries, and small computers is a fast growing industry. In a column called "Technology", edited by Stephen Kindel, on March 28, 1983, he noted that 2% of the households in the U.S.A. own computers of one form or another. There had been predictions of 40% of households by 1990. This has been reduced to 20% in 1990 because there doesn't seem to be software that is useful in households.

Mr. Kindel ends this article with a quote from Seymour Papert, an MIT professor:

"The real purpose of learning how computers work should be to improve human logic and thought processes, to make people more creative, not simply more dependent on machines."

Maybe this would be a good issue to review the tools available in our back issues. This issue contains the APL scanner. I am embarrassed to print this, not because of the program's quality, but because it was submitted four years ago. Well, no time like the present.

In issue #17 (yellow), Arthur Sale submitted "Referencer", a procedural cross reference. This program provides a printout of the heading of each procedure and function with indentation showing nesting. In issue #25, Mr. Yavner has improved on this program with "A Better Referencer". Mr. Yavner claims that *Pascal News* has been his sole source of instruction in Pascal. I believe this is a compliment to Andy Mickel and Rick Shaw for their efforts to maintain this newsletter. We should also thank our contributors, Mr. Sale for instance, for outstanding generosity. These people will appreciate your complements, criticisms and gifts of money. (Ho! Ho!)

Andrew Tandenbaum, in issues 21 and 22/23, provided us with "The EM1 Compiler". This is a good look at all that is necessary for a pseudo 32-bit machine Pascal compiler.

The UCSD Pascal Project started with a 16-bit pseudo machine portable compiler. It was called P4 out of Zurich, Switzerland by Vrs Ammann, Kesav Nori and Christian Jacobi. I mentioned this because it has been published with critical commentary by S. Pemberton and M.C. Daniels in 1982. It is presented as a

case study of compiler design and is very interesting to read.

Pascal Implementation

S. Pemberton and M.C. Daniels
Ellis Horwood Limited Publishers

Distributed by:

John Wiley & Sons
605 Third Avenue
NY, NY 10016
USA

In #21 you will find Jeff Pepper's fine implementation of extended precision arithmetic.

Nicklaus Wirth, Pascal's creator, wrote Pascal S and we have it in #19 (misabeled #17). This is a subset of Pascal and was intended as a teaching aid.

Also in #19 is a Lisp interpreter written in Pascal.

"MAP", a Pascal macro preprocessor for large program development, is published in #17.

Issue #16 contains the Validation Suite version 2.2. This is the compiler checker that Arthur Sale and Brian Wickman have now revised to version 3. This new version is available by using the Validation Suite coupon in the rear of this issue.

"Prose", a text formatter, by John Strait is the major program available in #15. A disclaimer in the instructions manual admits that it doesn't do everything, but I must say, it has a lot of capability.

In #13, two programs were printed that performed the same work. A sort of "Battle of Algorithms". "Pretty Print" and "Format" used any Pascal programs as input and printed it in a consistent style.

For those of you looking for other Pascal periodicals, there are four of which I know. "Pascal Market News", 30 Mowry Street, Mt. Carmel, CT. 06518. This is a nice quarterly for \$9.

Another quarterly for Oregon Software users is the "Pascal Newsletter". Maybe this is too narrow in content, but you will know what Oregon Software is up to. Their address is 2340 SW Canyon Rd., Portland, OR. 97201.

A very slick magazine with good design is "Journal of Pascal and Ada." You can contact them at West Publishing Company, 898 South State Street, Orem, UT. 84057. The cost is \$14 for six issues.

The USUS News and Report is more a system user's journal, but the system is based on Pascal. They also have a software library, seventeen floppy disks full, and all in source code and written in Pascal.

Now to the business of *Pascal News*. *Pascal News*, as the Pascal periodical granddaddy published since January 1974, has had its ups and downs. In 1979 our circulation was 7,000; now it is 3,600. Our biggest problem has been irregular publication. I am committed to four issues this year and I am considering six issues next year. I believe that regularity will supply us with growth and members and more software tools.

As I mentioned in the last issue, PUG (AUS) has stopped and I, in the USA, have taken over their area. Unfortunately, they have not sent me their mailing list and I fear that I have lost touch with our members there. This issue will be sent to those members listed as of 1979 and I hope they will "spread the word" and the subscription coupons!

Open Forum

Our PUG (EUR) has performed very nicely and I thank Helmut Weber and friends for their good work. But they have a problem concerning money. They have not charged enough for subscriptions and were pressed to send our #24. As a result, I will mail all issues directly and I hope you will not be inconvenienced. Please keep in touch with them as they are a strong group.

I have saved the worst for last. In November, 1982, I sent 300 copies of issue #24 to Nick Hughes in care of PUG (UK), Post Office Box 52, Pinnen, Middlesex HA5 3FE, United Kingdom. Using the phone number 866-3816, the air express shipper delivered these issues by mid-November. All well and good. The issues arrived before the cover date with plenty of time to post them to our English members. I called Nick at this number many times, but spoke to him only after many months. It was late April and I asked if I should use the same procedure in shipping #25 to him.

Nick said that the issues arrived properly and that method was efficient but wanted to know what was in #25. He told me that he did not like issue #24 and from the sound of it, did not like issue #25. He had disliked #24 so much, he decided not to send any of them out. Need I say more?

Nick will not supply his mailing list so I am sending this issue and #25 directly to the members of record in the United Kingdom as of 1979. If you feel a need to find out why Nick Hughes did not like issue #24 or would like to see it yourself, please call or write Nick at the above address and ask for your copy. He has 300 and I am sure he can spare one.

As a result of these difficulties, I will receive and service all subscriptions from here in Cleveland, Ohio. From now on, there will be only one person to blame if you have a complaint.

As of this issue, a year's subscription is raised in price to \$25 a year and \$50 for three years. These represent two sets of costs; production and organization. Production costs are typesetting, printing and mailing. Other activities of production are editing, reviewing, quality assurance and formatting. These tasks are performed by "yours truly" and presently I do them for free. (I'm real smart!)

Organization is a cost of servicing you and other members satisfactorily. This includes collecting and reviewing the mail, depositing checks, updating the mailing list, sending back issues to fill new subscriptions and sending sets of previous years back issues. In order to do this correctly, and in a timely fashion, I don't do it. I pay a firm to perform "fulfillment" and it takes one or two days per week. This cost is small compared to the bad feelings generated if not done correctly and quickly.

These are costs of which you are totally responsible. This newsletter has been a beneficiary of volunteerism. There are no volunteers now (save me). In many magazines, advertisements will pay for all production and organizational costs plus provide profits, sometimes large profits.

The cost of a full page ad in *Byte* or *PC* or *PC World* is over \$2,000 and these are publications with 500 pages!

Now we may be able to keep our costs down and publish more often if we accept advertising. Three hundred dollars per page is not expensive. I will pursue

advertisers and I am asking for your help. If you are writing a book, have your publisher advertise with *Pascal News*. If you are making software packages, influence your boss in the virtues of an ad in *Pascal News*. If you manufacture or sell computers, sell your product from the pages of *Pascal News*. This is the oldest Pascal publication and, I proudly say, the most influential.

This newsletter help spread Pascal and our members were most influential in the standard efforts.

I believe *Pascal News*' new mission is to enable Pascal to be taught in the easiest way. This is in many forms. For instance, reviews of books and texts, discussion of what features to teach first as a foundation, how to teach advanced courses, discussions of extensions or standard program tools to include in every well written program as it is appropriate.

By the way, Andy Mickel tells me that the "Pascal User's Manual and Report" by Jensen and Wirth has sold 150,000 copies in 1982. This is interesting considering that in the previous seven years, it sold 175,000 copies. A very sharp jump in interest.

A new text book has been sent to me, "Pascal" by Dale/Orshalik, 1983 DC Heath. A nice title, short and to the point. The preface states a philosophy that I would like you to comment on.

"In the past there have been two distinct approaches used in introductory computer science texts. One approach focused on problem solving and algorithm design in the abstract, leaving the learning of a particular language to a supplemental manual or a subsequent course. The second approach focused on the syntax of a particular programming language, and assumed that the problem-solving skills would be learned later through practice.

We believe that neither approach is adequate. Problem solving is a skill that can and should

be taught — but not in the abstract. Students must be exposed to the precision and detail required in actually implementing their algorithms in a real programming language. Because of its structured nature, Pascal provides an effective vehicle for combining these two approaches. This book teaches problem-solving heuristics, algorithm development using top-down design, and good programming style concurrently with the syntax and semantics of the Pascal language."

One of the letters mentions high resolution graphics. I know of two texts that use Pascal as the illustrative language of their algorithms. They are "Principles of Interactive Computer Graphics" by Williams Newman and Robert Sproull, 1979 McGraw-Hill and "Fundamentals of Interactive Computer Graphics" by James Foley and Andries Van Dam, 1982 Addison-Wesley.

Two notes from members:

Steven Hull of Campbell, California, received a notice from me that #22/23 had been returned to us because the postal service will not forward bulk mail. His reply:

"I guess this will teach me to move from Lakewood (a suburb of Cleveland, Ohio). Didn't know bulk mail wasn't forwardable. The Postal Diservice has been re-routing every piece of junk mail for a full year . . . I might have to file suit to stop it all!

And from Eric Eldred of New Hampshire who rewarded *Pascal News* with a three year subscription and dutifully filled the coupon with name and address and arrived at a request for "Date". Eric filled in "No! Married!". Thanks Eric, I needed that!

Charlie

To Charlie Gaffney,

I'm glad you have taken on *Pascal News*. I hope it works.

Perhaps, I should say what I would like to see published in *Pascal News*. The most valuable things are 1) Tools, and 2) Info on the various implementations. In my job we are using many computers. It is very helpful to know which compilers work well, meet standards, and produce efficient code. Apple Pascal is nearly bug free, and works as specified (with UCSD quirks). IBM Pascal VS is good — extensions are large presenting conversion problems if they are used. It has a good interface to FORTRAN. VAX Pascal is plain vanilla, appears to work well but we have not tested it in difficult situations. HP Pascal 1000 works fine but does not have a stack architecture and seems to compile slowly. Recent tests on HP Pascal 1.0 for the HP 200 computers seem to indicate it derives from UCSD although it is a native code 68000 compiler. It seems to work very well. We are interested in Pascal for the Data General Eclipse.

Good luck,
Dennis Ehn
215 Cypress Street
Newton Centre, MA 02159

Gentlemen:

Would you be so kind as to send information on the Pascal User's Group (PUG) and its official publication *Pascal News*. Recently we have acquired a microcomputer Pascal compiler and are very much interested in keeping up with current developments in Pascal.

Our system is based upon a SouthWest Technical Products Corporation S/09 computer, running the UniFLEX Operating System (similar to UNIX). If specific information is available for this unit, please let us know.

Additionally, the college has several (approximately 18) Apple computers which are capable of running the UCSD Pascal System. Once again, any special information here would be very helpful.

We look forward to hearing from you and hope that we can make a positive contribution to the Pascal User's Group.

Yours Truly,
Lawrence F. Strickland
Dept. of Engineering Technology
St. Petersburg Jr. College
P.O. Box 13489
St. Petersburg, FL 33733

Dear Sir,

I just received issue number 25 of *Pascal News* and was surprised to find an implementation note for our

Open Forum

Pascal compiler. What makes it surprising is that to the best of my knowledge I have never sent in an entry, and the information provided is about a year and a half out of date.

In case you would like to provide your readers with valid information, I have enclosed an implementation note for the currently available compiler. I have also enclosed a copy of the ISO validation suite report from our language manual.

Work is currently being done on moving this compiler to the 68000 family of processors and should be available by the end of 1983.

On another note, I have received issues number 21, 22/23, and 25, but not issue 24. I am also enclosing a check for a 3 year membership — please see if you can determine what happened to number 24.

Sincerely,
Robert Reimiller
Owner, OmegaSoft
5787 Brandywine Ct.
Camarillo, CA 93010

December 1, 1982

I hope the letter referring to the possible end of the P.U.G. is wrong! I can be of some help if needed.

Allen Duberstein
Pine Instrument Co.
3345 Industrial Blvd.
Bethel Park, PA 15102

January 10, 1983

Dear Mr. Gaffney:

Enclosed is a check covering both the remailing cost of *Pascal News* #24 (\$5) plus my membership renewal for two years (\$18).

My apologies for getting out of synchronization with the Pascal Users Group. As the post office informed you, I recently moved to the address noted. Frankly, I hadn't received a *Pascal News* in so long that I simply forgot about it. It appears that I won't miss any issues — the enclosed All-Purpose Coupon is from issue #23.

Interestingly, after a long period (3 years) of not using Pascal, it looks like I will be using it once again. We have a couple of Convergent Technologies workstations in my office. These are very nice 8086-based machines; Burroughs sells them as the B-20s, and NCR sells them as WorkSavers. We will probably be getting a Pascal compiler, and I am looking forward to getting back into Pascaling in the near future.

Sincerely,
Read T. Fleming
144 Irving Avenue #B-3
Providence, RI 02906